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Interregional migration propensity and labour market size, Sweden 1970-2001

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The tendency in several European countries toward an increase in commuting has sometimes been presented as one possible explanation for why interregional migration propensity has decreased. This study is an attempt to investigate the impact of job availability on migration propensity over time. Other studies have shown that the size of the labour market has an effect on migration propensity, the same effect was found in this study. However, no evidence was found that job availability has become more influential on migration over time. The process of extended commuting has thus not made commuting opportunities more important as explanatory factor for interregional migration.

Keywords: Interregional migration, labour market size, commuting, Sweden

EMMA LUNDHOLM区域间迁移的倾向及劳动力市场规模-以瑞典1970-2001为例，区域研究。许多欧洲国家通勤增加的趋势（为我们）提供了一种可能的解释，即为什么区域间迁移倾向减弱。本研究试图考察一定时间跨度内就业机会对迁移倾向产生的影响。其他相关研究表明，劳动力市场的规模对迁移倾向有一定影响，相同的影响在本研究中也得到了证实。然而，没有相关证据表明就业机会对迁移更具影响力。因此，通勤距离增加的过程并未使得通勤机会成为解释区域间迁移更重要的元素。

区域间迁移 劳动力市场规模 通勤 瑞典

La propension à la migration inter-régionale
et la taille du marché du travail: la Suède de 1970 à 2001.

Dans plusieurs pays européens, la tendance à l'augmentation du nombre des migrations quotidiennes se présente souvent comme une explication potentielle du déclin de la propension à la migration inter-régionale. Cette étude cherche à examiner l'impact des possibilités d'emploi sur la propension à la migration dans le temps. D'autres études montrent que la taille du marché du travail influe sur la propension à la migration; cette étude aboutit à la même conclusion. Cependant, rien ne prouve que les offres d'emploi inflent plus sur la migration dans le temps. Ainsi, les migrations quotidiennes de plus longue distance n'ont pas rendu plus importantes les possibilités des migrations quotidiennes comme déterminants de la migration inter-régionale.

Migration inter-régionale / Taille du marché du travail / Migrations quotidiennes / Suède

Neigung zur interregionalen Migration und Arbeitsmarktgröße, Schweden 1970-2001

Die Tendenz in mehreren europäischen Ländern hin zu einem verstärkten Pendlerverkehr wird zuweilen als mögliche Erklärung für die gesunkene Neigung zur interregionalen Migration präsentiert. In dieser Studie wird versucht, die Auswirkung der Verfügbarkeit von Arbeitsplätzen auf die Migrationsneigung über längere Zeit hinweg zu analysieren. In anderen Studien zeigte sich, dass sich die Größe des Arbeitsmarkts auf die Migrationsneigung auswirkt; derselbe Effekt wurde auch in dieser Studie beobachtet. Hingegen wurden keine Anzeichen dafür festgestellt, dass die Verfügbarkeit von Arbeitsplätzen im Laufe der Zeit einen stärkeren Einfluss auf die Migration ausgeübt hat. Die Zunahme des Pendlerverkehrs hat also die Möglichkeiten zum Pendeln nicht zu einem wichtigeren Faktor zur Erklärung interregionaler Migration werden lassen.

Keywords:
Interregionale Migration
Arbeitsmarktgröße
Pendlerverkehr
Schweden

Predisposición a la migración interregional y el tamaño del mercado laboral, Suecia 1970-2001

La tendencia en varios países europeos hacia un aumento de los desplazamientos al trabajo se ha presentado a veces como una posible explicación a la disminución de una predisposición a la migración interregional. El objetivo de este estudio es investigar el impacto de la disponibilidad de puestos de trabajo en la predisposición a la migración a largo plazo. En otros estudios se ha mostrado que el tamaño del mercado laboral tiene un efecto en la predisposición a la migración y el mismo efecto se ha observado en este estudio. Sin embargo, no se han hallado evidencias de que la disponibilidad de puestos de trabajo haya tenido con el tiempo más influencia en la migración. El creciente proceso de desplazamientos al trabajo no ha provocado por tanto que las oportunidades de estos desplazamientos sean un factor más importante para explicar la migración interregional.

Keywords:
Migración interregional
Tamaño del mercado laboral
Desplazamientos al trabajo
Suecia

J61 - Geographic Labor Mobility|Immigrant Workers < J6 - Mobility, Unemployment, and Vacancies < J - Labor and Demographic Economics, R23 - Regional Migration|Regional Labor Markets|Population < R2 - Household Analysis < R - Urban, Rural, and Regional Economics

Introduction:

Access to a large, diverse labour market within tolerable commuting distance is a condition that can influence one's choice between staying and moving. The access to commuting opportunities can therefore contribute to the understanding of preconditions for interregional migration as job access within commuting distance can be considered an alternative to interregional migration. A trend of extended commuting behaviour has been observed in Sweden and elsewhere, this could imply that better transportation and flexible working conditions has reduced some constraints associated with commuting, and hence make commuting a more preferable option compared to migration. If so, commuting opportunities has become increasingly important in understanding interregional migration. This study is an attempt to investigate the impact of job availability on migration propensity.

During recent decades there has been a tendency in several European countries toward a growing average distance between residence and workplace, and this has resulted in an increase in commuting both in number of people who need to travel a considerable distance to work on a daily basis and the average length of work trips. This development is sometimes put in relation to inter-regional migration tendencies, and has even been presented as one possible explanation for why interregional migration propensity has decreased, especially among people of working age (KULLENBERG and PERSSON, 1997; SOU, 2007; WESTERLUND, 2001). Several studies have confirmed that people who live in regions with dense labour markets are less likely to migrate (ELIASSON et al., 2003; ERIKSSON et al., 2007; VAN HAM et al., 2001b). There are, however, no empirical studies on the development over time of this inhibiting effect on the interregional migration apparent in large labour-market regions.

If outstretched commuting were substituting interregional migration to a larger extent today than before, migration propensities would have declined more in regions where people have better job availability (larger labour markets). The aim of this study is to investigate the hypothesis that the impact of labour market size on interregional migration propensity has become stronger over time. The empirical study is designed to test the migration propensity among all residents aged 18-64 in Sweden during the years 1970, 1985 and 2001, depending on the size of the labour market of residence.

The interrelation between migration and commuting

Both long-distance work trips and interregional migration are marginal phenomena; the majority of people work near their home and the majority stay in their region of residence from one year to another. Nevertheless, these processes are important for the functionality of the labour market, facilitating the match between workforce and jobs. The interrelation between migration and commuting has been described by Evers and Van der Veen (1985), for instance, who conclude that migration and extended commuting can be considered as *substitutes* if work and residence are geographically separated, but that they can also be considered as *complements* as extended commuting can be a consequence of migration if a person chooses to move away from their workplace locality (for example, suburbanisation). A wide commuting tolerance range could also enable interregional migration, making it possible to choose to live in a peripheral location and travel to work at a distant location. In other words, improved commuting opportunities can both impede and facilitate migration.

Job availability could therefore be an important factor in the decision to migrate or not. If an individual cannot find a suitable job in his/her current locality there are three options: First, to stay in the current locality and accept a state of underemployment or a job for which the person is overqualified; second, to expand one's commuting tolerance range and job search radius and lengthen working trips; or third, to accept migration, extend job search radius and migrate to another region.

When the geographic scope of a job search area is restricted, job matching works less efficiently and unemployment as well as overqualification become more likely. There is empirical evidence that overqualification is more common in small labour markets (BUCHEL and BATTU, 2003; MCGOLDRICK and ROBST, 1996). Buchel and Battu (2003) conclude that commuting is an efficient way to reduce this risk but that women are more spatially constrained than men are. This is mainly explained by women's obligations concerning family responsibilities. According to the theory of differential overqualification (FRANK, 1978), there is a link between migration and underqualification of women. Women in small labour markets run a higher risk of overqualification, i.e. working in jobs where their current qualifications exceed the requirements for that particular job; the reason for this is that of household location in general is determined by the optimization of the male's career, and the options for married women are limited since they are considered "tied stayers" or "tied movers" (MINCER, 1978) and have a more limited geographical job search area.

The prospect of finding a suitable job is better in a large and more diverse labour market. According to Fieldings (1989; 1992) 'escalator region model' the prospect is also better for

upward social occupational mobility in urban areas, which attracts especially young people to migrate to these areas. Several empirical studies show that migration propensity is lower in larger labour market areas (ELIASSON et al., 2003; ERIKSSON et al., 2007). One interpretation is that if job availability is ample, many people seem to choose to stay and search for jobs in their present location, while in a more peripheral location where it is more difficult to find job options within a tolerable commuting distance, long-distance migration becomes a more likely outcome. Another interpretation in line with arguments by Gordon (1988) is that a proportion of potential migrants, who are prepared to migrate, find employment in their current region and chooses to commute and therefore never become migrants. It could be argued that this is more likely to occur in larger labour market regions compared tp smaller ones. The higher propensity of people to stay in larger labour-market regions can be explained by the diversity of the labour market, which is especially important for dual-career households. It could also stem from other attractions such as the supply of education, healthcare and entertainment (WESTERLUND, 2001). Detang-Dessendre et al. (2002) found a similar tendency in France, where living in a rural or semi-rural area close to a larger city had an inhibiting effect on migration compared to living in more isolated localities, but this effect was only significant for young people as opposed to the middle-aged and elderly. Van Ham et al. (2001b) found a gendered commuting substitution effect whereby married men with children were more likely to substitute migration by commuting but that women in the same situation were less flexible in terms of both commuting and migration. However, unmarried women without children were found to be as flexible as men.

In the literature, possible trade-offs between migration and commuting have often been discussed from a perspective of intraregional mobility (mainly urban) by which a person has a choice, to either move or commute to a given job (EVERS and VAN DER VEEN, 1985; FRANSSON, 1991; VAN HAM and MULDER, 2005; VAN HAM et al., 2001b). This study, however, focuses instead on interregional migration when the migration-commuting choice is between accepting a job that requires migration or staying in one's present locality and tolerating a longer commute to another job. Choosing to live in a region with good access to labour market opportunities within commuting distance could be viewed as a strategic choice for establishing a better platform for a partner's employment and one's own future jobs (VAN HAM et al., 2001a).

In several Western countries, for instance Sweden and the Netherlands (VAN HAM and HOOIMEIJER, 2005), migration tolerance has decreased – at least for those who are in the labour force – and commuting tolerance has increased over the past decades. The observed increase in travel distance to work has been presented as a possible explanation for why interregional migration has declined (FRANSSON, 1991; KULLENBERG and PERSSON, 1997; SOU, 2007; WESTERLUND, 2001). According to such "substitution hypotheses", people today are more likely to choose extended commuting over other options, including interregional migration. The causal relationship between commuting and migration is, however, difficult to establish. Increased commuting is sometimes described as a result of improved transport systems (YAPA et al., 1971) and a more flexible labour market, reducing the cost of commuting in terms of time and money. Green (2004) exemplifies how employers and employees increasingly substitute intra-organisation relocation by short–term assignments and weekly commuting. Interregional migration would thereby become

increasingly redundant as job search areas could be extended without having to relocate one's place of residence. The inverted argument would be that commuting is a result of restrictions in interregional migration; higher costs for migration make commuting a more attractive option. In the latter case, an increase in commuting is a result of people becoming more tied to a place by dual incomes or because they prefer to stay in a certain living environment for other reasons.

If the relative interregional immobility among families and people in the labour force were a result of substitution of interregional migration by daily mobility over longer distances, the difference in migration propensity in regions with ample job availability compared to more isolated ones would be larger in 2001 compared to 1970 and 1985. If, on the other hand, the inhibiting effect of living in a larger labour market were the same today as it was in 1970 and 1985, the result would suggest that people have become equally less migratory everywhere, regardless of job availability. In the first case, the conclusion would be that extended travel distance is one explanation for migration decline. In the latter case, the conclusion would be that longer travel distances are the result of migration reluctance.

Trends in interregional migration and commuting

Interregional migration rates declined in Sweden during the period from the 1970's to the mid-1980's; thereafter, interregional migration increased again. The decrease from the high levels of migration in the 1960s and 1970s has been explained by Bengtsson and Johansson (1993) mainly as a result of restructuring and the expansion of the public sector. The increase in migration in recent decades is essentially an effect of increased migration propensity among young people outside the labour market, mainly students while families

with children are becoming less migratory compared to thirty years ago (ISRAELSSON et al., 2003; JANS, 2005b; JOHANSSON et al., 2004; LUNDHOLM, 2007). There are several possible reasons for this increasing immobility among the gainfully employed; the organisation of the labour market with more short-term and insecure jobs could be one explanation, as could changing values and attitudes, which make more people unwilling to relocate. The development of an increasing share of two-income families is one important explanation for why people become more reluctant to migrate. Having a partner who works is known to reduce mobility and generate "tied stayers" among both women and men (BUCHEL and BATTU, 2003; GREEN et al., 1999; NIVALAINEN, 2005; SMITS, 1999). GREEN and CANNY (2003) finds that children's schooling is an important consideration for families when considering relocation. In Sweden, families including children who are in school (age 7-18) are found to be particularly reluctant to migration (FISCHER and MALMBERG, 2001).

Daily commuting has increased, in Sweden as well as in other European countries, in terms of both range and number. The average distance travelled to work in Sweden has increased by more than 50% during the past three decades; in 1970 the average commuting distance was estimated at 10 kilometres and in 2001 the corresponding distance was 15.6 km (SOU, 2003). It is important to keep in mind that the commuters behind this extension still constitute a minority, and the daily activity space of the majority of the population is unaffected by the extended commuting zones. Most people live close to their workplace; in Sweden in 2001, 50% of all men lived less than eight kilometres from work and 50% of women lived less than six kilometres from work. Only 5% of all women and 10% of all men travel further than 40 kilometres (SOU, 2003).

However, local labour markets are not equally accessible by all groups. Men and more qualified workers have access to larger labour markets than do women and less skilled workers (ÖSTH, 2007). This gender difference is explained by the unequal division of labour within the household, where women take on the most responsibility and therefore need to have shorter work trips in order to fulfil their obligations; for men, commuting is enabled by having a wife who facilitates daily life (HANSON and PRATT, 1991; JOHNSTON-ANUMONWO, 1992). The extended labour market for more skilled workers can be attributed to the segmented labour market where more skilled have more career opportunities and more to gain from commuting but also from specialisation that makes a large labour market more necessary for more skilled labour. Differences in commuting behaviour between skill-groups (and also other subgroups) are especially observable in more peripheral localities within the local labour markets. The reason for this is that as commuting becomes more costly, differences between groups become more evident (ÖSTH, 2007).

In Sweden and the other Nordic countries, large investments in infrastructure are being made to facilitate job commuting and politicians have expressed that expansions in work trips are a means to solve the problem of labour-market matching and trigger economic growth through better utilisation of skills and reduction of unemployment (NUTEK, 2000, 2001). Others question the blessings of longer work trips from different perspectives, for instance Boverket (2005) highlights the negative effects of long job trips in terms of environmental concerns, and in terms of social concerns from a child's perspective. Sandow and Westin (2007) conclude from their survey that a majority believes that the costs of daily

commuting over distances that take more than 45 minutes of travel are too high and that this limits further expansion of commuting zones.

The trend of increased commuting can be interpreted as a result of people becoming increasingly reluctant to migrate, and therefore expanding their commuting tolerance length in order to be able to make a living while avoiding migration. Commuting is then regarded as a fair price for choosing residence in accordance with one's own preferences. This is only one of several hypotheses that could explain the development of extended commuting. Short-distance migration can also be an underlying cause of increases in commuting, as a settlement pattern characterized by suburbanisation has increased the distance between residence and work, and this pattern requires longer commuting (VERKADE and VERMEULEN, 2005). Another underlying circumstance is that ongoing improvements in transportation systems allow us to travel further in the same amount of time, which means that the commute can be longer without affecting the time consumed for travel (FRÄNDBERG et al., 2005) .

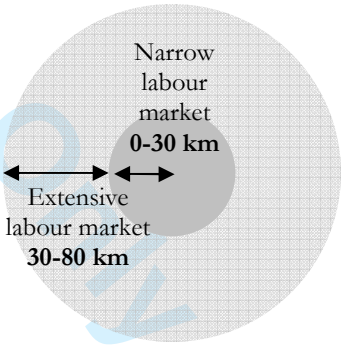
Data and method

The data used in this study consist of the entire working-age population of Sweden, those 18-65 years old during the years 1970, 1985 and 2001. Migrants are identified as people who migrated between parishes during the periods of 1969-1970, 1984-1985 and 2000-2001. None of the three time periods are extreme with regard to economic cycles. The deep recessions in the beginning of the 1970-ties and the early 1990-ties are avoided. A parish is an administrative unit; Sweden was divided into 3,170 parishes in 1970 and 2,223 in 2001.

Migration distance is calculated as the distance between parish centroids, and interregional migrants are defined as persons migrating 150 kilometres or more.

In this study, the range of 150 kilometres as the definition of interregional migration was chosen for two reasons. First, as Zax (1994) points out, it is important to isolate interregional migration by which the migrant relocates both work and housing and thereby avoids including residential mobility, since the mechanisms behind these two phenomena are partially different. Second, the 150-kilometre range helps avoid gravitation effects; i.e., people living in areas close to urban areas are more likely to migrate compared to those living in more isolated places because of the pull effects of population concentrations. Or in other words, people are more likely to migrate when there is somewhere to migrate to, at a close range, than if there is not. The existence of such an effect has been found by, for instance, Fotheringham et al (2004).[i]

In this study, job availability is defined as the size of the local labour market where the person resides during year one (1969, 1984, 2000), which is approximated by the size of the working-age population at a given Euclidian distance[ii]. Two zones are studied: first, *the narrow labour market* surrounding each parish centroid with a radius of 30 kilometres. Within this distance, the daily activity space offers commuting possibilities that have an impact on daily life but still fall within boundaries that many people can accept (30-45 minutes' travel time) [iii]. The outer realm of the labour market is 30-80 kilometres, *the extensive labour market* involving commuting costs that are unthinkable for some people but that many people find



an acceptable commuting range. The labour markets are hence calculated as individual labour markets for each parish centroid. Job availability is thereby a feature of the locality where the individual resides. The actual individual access to the job availability of a locality might be restricted. We know that working trips are generally shorter for married women and less skilled workers; the control variables age, sex, civil status and education level are therefore included in the analysis.

In-migration and out-migration are strongly correlated on the regional level; this means that regions with high levels of in-migration also have high levels of out-migration. Especially urban areas are very likely to have high levels of in-migration, but also high levels of out-migration, since a person who has recently migrated is known to be more prone to migrate again (FISCHER and MALMBERG, 2001; GORDON and MOLHO, 1995). The most mobile group of young, recent migrants are found in urban areas and there is therefore a positive correlation between migration propensity and population density. Another factor that contributes to high migration rates in densely populated areas is the concentration of rented housing in urban areas. People who are expecting to move again soon are more likely to choose rental rather than owner-occupied housing; it is well established that people living in owner-occupied housing are less migratory (FISCHER and MALMBERG, 2001; HELDERMAN et al., 2006). By including recent migration in the analysis, the higher migration propensity in urban areas due to this selection effect is somewhat controlled for. People who were not living in their present municipality four years earlier are defined as recent migrants.

Migration propensity is tested in a logistic regression model in which the effects of size of the labour market zones are included as independent variables. The model also includes the individual variables age, sex, civil status, children (<age 18) living in the household, education level and recent migration. These are individual characteristics during year two[iv] (after migration, if any - 1970, 1985, 2001).

Results

Figure 1 is a description of interregional migration rates for the years included in this study. The total migration frequency for long-distance migration (>150 kilometres) was lower in 1985 compared to 1970 and 2001. The rise in migration rates from the low levels of the mid-1980's to 2001 is explained mainly by high migration rates among young people (mainly students) (ISRAELSSON et al., 2003; LUNDHOLM, 2007; SOU, 2007). The migration rate among adults living with children under age 18 in the household was much lower in 1985 compared to 1970, and there had been no increase in the migration rate within this group in 2001.

In order to compare migration propensity between individuals living in regions with access to high job availability and those living in regions with lower job availability, and to investigate differences in this effect over time, the propensity for interregional migration in 1970, 1985 and 2001 was tested in separate logistic regressions[v]. Independent variables were age, sex, civil status, having children, education level, recent migration and size of labour market. Results from the analysis are presented in Table 1.

Results from the controlling variables were expected. Migration propensity decreases with age; this is more evident in 2001 compared to 1970 and 1985. Being married and having

children reduces the propensity to migrate, while higher education increases the likelihood of being a migrant. The positive effect on migration by higher education has decreased since 1970, which could be attributed to a larger proportion of the population being included in this category and a large proportion of the addition to this group being employees in the public sector, with a dispersed localisation pattern (for further discussion on the development of migration propensity during the period 1970-2000 for different groups, see Jans (2005a) and Lundholm (2007). As expected, recent migration had a strong positive effect on migration propensity.

As expected, migration (>150km) was less likely among those living in parishes situated situated in labour market areas with higher job availability, compared to residents in more areas of less job avaliability. A large labour market provides alternatives to migration, as the prospect of finding a suitable job without having to migrate is better. The sizes of both the narrow and the extensive labour markets contributed to reducing migration propensity.

The analysis is based on the hypothesis that access to commuting opportunities has become more important for migration behaviour as a result of the extension of commuting zones. If so, the substitution effect would manifest itself in an increase in the reducing effect over time on migration propensity caused by living in a large labour-market region. Further, the effect of job availability in the extensive commuting zone would be expected to have a stronger impact on migration propensity in 2001 compared to 1970 and 1985. However, the empirical findings do not support these hypotheses. The results from regression analysis show that the inhibiting effect of residing in a large labour market is the same for all three years. The significant difference found between the three years was that the inhibiting effect

of job availability, estimated by the size of the narrow labour market, was somewhat weaker in 1986 than in 1970, which means that those who lived in the densest areas locally were more prone to migrate in 1986 than in 1970, which could be an effect of a counter-urbanisation trend at that time. However, in general, job availability in both a narrow and extensive labour market had a similar inhibiting effect on migration during the years 1970, 1985 and 2001.

Migration propensity among parents compared to others was significantly lower in 2001 compared to both 1985 and 1970, suggesting that migration tolerance for this group is lower today than before. An important explanation could be the increase in dual-income households. This makes this group especially interesting in testing the commuting substitution hypothesis, since it is reasonable to assume that as families have become more tied to their region and reluctant to migrate, they are more prone to accept longer commuting as a substitute, if they have access to ample job availability.

Data in this study are individual and contain information on civil status and children in the household for individuals, but unfortunately there are no data on, for instance, partner's employment or education level; therefore, dual-income families cannot be studied explicitly. Despite this, an attempt was made to study families in comparison with other groups; for this purpose, individuals with children are analysed separately as a proxy for family migration. By introducing interaction variables for family, a model tested whether the effect on labour-market size differs between individuals with children and individuals who do not live with children. The results from this analysis are found in Table 2.

The inhibiting effect on migration of living in a region with ample job availability in the extensive labour market (30-80 kilometres) was stronger for persons with children compared to others in 2001. This was not the case in 1985, when families did not significantly differ from others, and in 1970 when the migration propensity was somewhat higher for families in regions with ample job availability than for others. This result give some support for the presence of a substitution effect between commuting and long-distance migration for this subgroup, since families appeared to be less prone than others to choose interregional migration if the commuting opportunities were good in 2001, as opposed to 1985 or in 1970 when there was no such effect.

The effect on migration propensity of living in a large, narrow labour market was more positive for families with children compared to others during all three years, and the effect was stronger in 2001 than in 1970 and 1985. This result is difficult to interpret, but could be explained by the preference among families to leave the most densely populated areas (facilitated by improved commuting options), or as a result of this group being pushed out because of the housing market. The definition of interregional migration as migration exceeding 150 kilometres should exclude suburbanisation, but there might be a spill over effect of families who leave the urban areas for more remote destinations.

In summary, this study confirms the results from prior studies that people are less likely to migrate in larger labour-market regions. Living in a large, diversified labour market allows people to stay rather than migrate to another region. The analysis of this effect of labour-market size on migration propensity over time produced some mixed results. In general, the impact of commuting opportunities on interregional migration rates is not higher in 2001

than it was in 1970 or 1985. There are no evidence that the trend of extended commuting have affected the rate of interregional migration in general. On the other hand, when looking at the subgroup, persons in households including children, the impact of living in a region with favourable commuting opportunities seems to have a more inhibiting effect on families compared to others in 2001, which is different from 1970 and 1985. But the casual relations here should be interpreted with caution, not least since the process of extended commuting seems to be a more general phenomenon.

Discussion

A person who lives in a location with ample job availability has better prospects of choosing to stay rather than migrate; thus job availability is one factor that could explain non-migration. Migration does not become as compulsory when one has access to many potential jobs, and a diversity of jobs, within commuting distance. The result of this study suggests that there could be a substitution effect between interregional migration and commuting, since those who live in localities with poor job availability are more inclined to migrate. This relation is stable over time and therefore no support is found for the notion that the trend of extended commuting is suggesting that access to commuting opportunities has become more important for interregional migration over time.

Has increased job commuting replaced interregional migration or is the relationship the opposite – has decreased interregional migration forced the process of extended job commuting? The results of this study suggest that the latter is the case. Extended commuting has a more important role in facilitating labour-market matching today than before as people become more reluctant to migrate inter-regionally, but this growing reluctance seems to be

distributed equally across labour markets regardless of size. Although access to commuting opportunities does have an effect on migration behaviour, this relation has not changed over time. Increased commuting can facilitate job matching and reduce the risk of over-qualification at a regional level, but this study indicates that increased commuting has not reduced interregional migration.

An possible explanation why the influence of commuting opportunities on migration behaviour has not increased, despite the reported extended commuting, could be that the statistical evidence of extended commuting is misleading and a result of misinterpretation of the statistics rather than an actual development (AMCOFF, 2007).

It is reasonable to assume that the causal relationship between increased commuting and the decrease in migration is not direct but rather indirect, via processes of ongoing changes in the labour market and household structures. Increased migration to commuting substitution might not be a general trend, but rather a tendency among increasingly less migratory groups, such as families. There are results in this study that confirm that there is a difference between families and others in this respect, but more research is needed in order to determine the extent of the differences between subgroups.

Further research could contribute to the understanding of the interrelation and dynamics of the processes of migration and commuting. Such research needs to take into account migration and commuting simultaneously, with empirical data on both actual migration and actual commuting. The measure of job availability could also be developed in a more sophisticated way, for instance by using number of jobs or job vacancies as quantification

and/or putting more weight to closer jobs compared to more distant (calculating a commuting potential, see for example COOMBES and RAYBOULD, 2001; 2004). More research could also further investigate the migration and commuting decisions of dual-career households and families with children, since this is a group that has been empirically proven to have become less migratory and theoretically could be a group that is increasingly compelled to use commuting as a means to solve labour-market matching. Another interesting issue is how overqualification is related to (lack of) migration and commuting opportunities.

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Table 1 Logistic regression estimates of odds of being interregional migrant (1= migrant>150km) (N=population in working ages 18-64)

	B (S.E)		
	1970	1985	2001
Woman	-0.006 0.008)	0.144*** (0.009)	0.121*** (0.007)
Man (ref)			
Age 18-20	-0.162*** (0.015)	-0.172*** (0.018)	0112*** (0.013)
Age 21-24	0.188*** (0.011)	0.260*** (0.014)	0.431*** (0.010)
Age 25-30 (ref)			
Age 30-34	-0.313*** (0.013)	-0.371*** (0.016)	-0.484*** (0.012)
Age 35-44	-0.775*** (0.013)	-0.715*** (0.015)	-0.925*** (0.013)
Age 45-54	-1.355*** (0.016)	-1.311*** (0.021)	-1.640*** (0.016)
Age 55-65	-1.897*** (0.026)	-1.674*** (0.023)	-1.935*** (0.018)
Married	-0.108*** (0.011)	-0.207*** (0.013)	-0.242*** (0.011)
Not married (ref)			
Children	-0.305*** (0.011)	-0.517*** (0.013)	-0.775*** (0.011)
No children (ref)			
High education	1.089*** (0.010)	0.893*** (0.010)	0.640*** (0.008)
Low education (ref)			
Recent migration	1.018*** (0.008)	1.226*** (0.010)	0.891*** (0.007)
Same municipality 4 years prior (ref)			
LM size 0-30 km (cont)	-0.130*** (0.003)	-0.107*** (0.004)	-0.112*** (0.003)
LM size 30-80 km (cont)	-0.275*** (0.004)	-0.271*** (0.005)	-0.271*** (0.004)
Constant	0.947*** (0.044)	0.259*** (0.051)	0.899*** (0.036)
N	4200830	4585523	5300630
Model chi-square	74618	61162	127901
-2 Log likelihood	650018	490127	774427
Nagelkerke R square	0.111	0.117	0.152

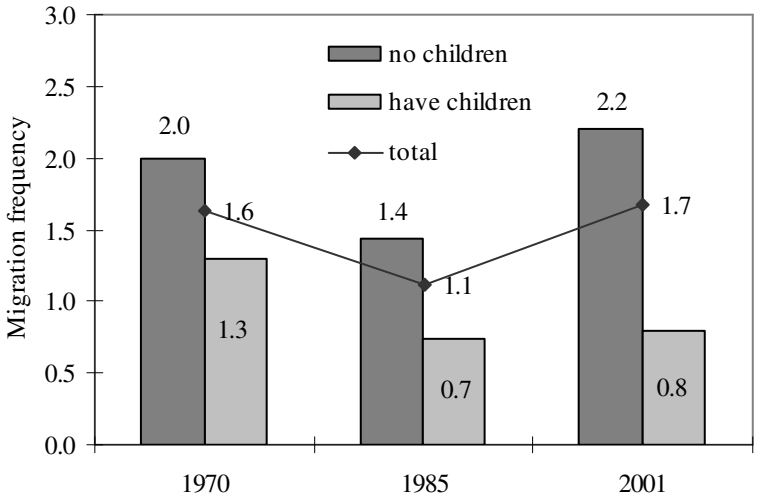
*** = p<0.001, **= p<0.01, *=p<0.05, Standard errors in parentheses

Table **2**: Logistic regression estimates of odds of being interregional migrant (1= migrant>150km) including interaction variables for having children (N=population in working ages 18-64)

	1970	1985	2001
Woman	-0.003 (0.008)	0.147*** (0.009)	0.124*** (0.007)
Man (ref)			
Age 18-20	-0.166*** (0.015)	-0.190*** (0.018)	0.090*** (0.013)
Age 21-24	0.187*** (0.011)	0. 253*** (0.014)	0.422*** (0.010)
Age 25-30 (ref)			
Age 30-34	-0.314*** (0.013)	-0.373*** (0.016)	-0.489*** (0.012)
Age 35-44	-0.772*** (0.013)	-0.721*** (0.015)	-0.933*** (0.013)
Age 45-54	-1.352*** (0.016)	-1.319*** (0.021)	-1.650*** (0.016)
Age 55-65	-1.896*** (0.026)	-1.685*** (0.023)	-1.950*** (0.018)
Married	-0.103*** (0.011)	-0.212*** (0.013)	-0.256*** (0.011)
Not married (ref)			
Children	-1.232*** (0.089)	-2.057*** (0.109)	-2.373*** (0.098)
No children (ref)			
High education	1.088*** (0.010)	0.890*** (0.010)	0.640*** (0.008)
Low education (ref)			
Recent migration	1.020*** (0.008)	1.233*** (0.010)	0.894*** (0.007)
Same municipality 4 years prior (ref)			
LM size 0-30 km	-0.148*** (0.004)	-0.147*** (0.004)	-0.147*** (0.003)
LM size 30-80 km	-0.289*** (0.006)	-0.272*** (0.006)	-0.259*** (0.004)
LM size 0-30 km * children	0.048*** (0.006)	0.137*** (0.008)	0.222*** (0.008)
LM size 30-80 km*children	0.032*** (0.009)	0.001 (0.011)	-0.078*** (0.010)
constant	1.321*** (0.056)	0.733 (0.059)	1.122*** (0.039)
N (included in analysis)	4200830	4585523	5396824
Model chi-square	74781	61620	128891
-2 Log likelihood	649856	489670	773438
Nagelkerke R square	0.111	0.118	0.153

** = p<0.001, **= p<0.01, *=p<0.05, Standard errors in parentheses

Figure 1 Interregional migration frequency (>150 kilometres, age 18-65)



Notes

[i] The results turned out to be robust at a closer range definition (80km) as well.

[ii] The use of straight-line distance for delimiting labour markets rather than the functional local labour markets defined by Statistics Sweden is motivated by the fact that these regions are defined by average municipal commuting behaviour. Using these regions defined by observed commuting behaviour as explanatory variable could have an unpredictable effect on the interpretation of the results.

[iii] Thirty kilometers might seem a short distance, but the actual distance on the ground is always longer since 30 kilometers (as well as 80 kilometers) refers to Euclidian distance.

[iv] Ideally, pre-move characteristics would have been more relevant, but that was not available in this dataset.

[v] Differences between the three years were also tested in the same model as interaction variables; thus the remarks on the differences between years in the text have statistical support. The tables presented were chosen because they were more readable.

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Interregional migration propensity and labour market size, Sweden 1970-2001

Abstract:

The tendency in several European countries toward an increase in commuting has sometimes been presented as one possible explanation for why interregional migration propensity has decreased. This study is an attempt to investigate the impact of job availability on migration propensity over time. Other studies have shown that the size of the labour market has an effect on migration propensity, the same effect was found in this study. However, no evidence was found that job availability has become more influential on migration over time. The process of extended commuting has thus not made commuting opportunities more important as explanatory factor for interregional migration. This result may turn the commuting migration substitution argument around, suggesting that the increase in commuting is a result of declining migration tolerance in all places, regardless of the size of the labour market.

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Keywords: Interregional migration, labour market size, commuting, Sweden

Introduction:

Access to a large, diverse labour market within tolerable commuting distance is a condition that can influence one's choice between staying and moving. The access to commuting opportunities can therefore contribute to the understanding of preconditions for interregional migration as job access within commuting distance can be considered an alternative to interregional migration. A trend of extended commuting behaviour has been observed in Sweden and elsewhere, this could imply that better transportation and flexible working conditions has reduced some constraints associated with commuting, and hence make commuting a more preferable option compared to migration. If so, commuting opportunities has become increasingly important in understanding interregional migration. This study is an attempt to investigate the impact of job availability on migration propensity.

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During recent decades there has been a tendency in several European countries toward a growing average distance between residence and workplace, and this has resulted in an increase in commuting both in number of people who need to travel a considerable distance to work on a daily basis and the average length of work trips. This development is sometimes put in relation to inter-regional migration tendencies, and has even been presented as one possible explanation for why interregional migration propensity has decreased, especially among people of working age (KULLENBERG and PERSSON, 1997; SOU, 2007; WESTERLUND, 2001). Several studies have confirmed that people who live in regions with dense labour markets are less likely to migrate (ELIASSON et al., 2003; ERIKSSON et al., 2007; VAN HAM et al., 2001b). There are, however, no empirical studies on the development over time of this inhibiting effect on the interregional migration apparent in large labour-market regions.

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If outstretched commuting were substituting interregional migration to a larger extent today than before, migration propensities would have declined more in regions where people have better job availability (larger labour markets). The aim of this study is to investigate the hypothesis that the impact of labour market size on interregional migration propensity has become stronger over time. The empirical study is designed to test the migration propensity among all residents aged 18-64 in Sweden during the years 1970, 1985 and 2001, depending on the size of the labour market of residence.

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The interrelation between migration and commuting

Both long-distance work trips and interregional migration are marginal phenomena; the majority of people work near their home and the majority stay in their region of residence from one year to another. Nevertheless, these processes are important for the functionality of the labour market, facilitating the match between workforce and jobs. The interrelation between migration and commuting has been described by Evers and Van der Veen (1985), for instance, who conclude that migration and extended commuting can be considered as *substitutes* if work and residence are geographically separated, but that they can also be considered as *complements* as extended commuting can be a consequence of migration if a person chooses to move away from their workplace locality (for example, suburbanisation). A wide commuting tolerance range could also enable interregional migration, making it possible to choose to live in a peripheral location and travel to work at a distant location. In other words, improved commuting opportunities can both impede and facilitate migration.

Job availability could therefore be an important factor in the decision to migrate or not. If an individual cannot find a suitable job in his/her current locality there are three options: First, to stay in the current locality and accept a state of underemployment or a job for which the person is overqualified; second, to expand one's commuting tolerance range and job search radius and lengthen working trips; or third, to accept migration, extend job search radius and migrate to another region.

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When the geographic scope of a job search area is restricted, job matching works less efficiently and unemployment as well as overqualification become more likely. There is empirical evidence that overqualification is more common in small labour markets (BUCHEL and BATTU, 2003; MCGOLDRICK and ROBST, 1996). Buchel and Battu (2003) conclude that commuting is an efficient way to reduce this risk but that women are more spatially constrained than men are. This is mainly explained by women's obligations concerning family responsibilities. According to the theory of differential overqualification (FRANK, 1978), there is a link between migration and underqualification of women. Women in small labour markets run a higher risk of overqualification, i.e. working in jobs where their current qualifications exceed the requirements for that particular job; the reason

for this is that of household location in general is determined by the optimization of the male's career, and the options for married women are limited since they are considered "tied stayers" or "tied movers" (MINCER, 1978) and have a more limited geographical job search area.

The prospect of finding a suitable job is better in a large and more diverse labour market. According to Fieldings (1989; 1992) 'escalator region model' the prospect is also better for upward social occupational mobility in urban areas, which attracts especially young people to migrate to these areas. Several empirical studies show that migration propensity is lower in larger labour market areas (ELIASSON et al., 2003; ERIKSSON et al., 2007). One interpretation is that if job availability is ample, many people seem to choose to stay and search for jobs in their present location, while in a more peripheral location where it is more difficult to find job options within a tolerable commuting distance, long-distance migration becomes a more likely outcome. Another interpretation in line with arguments by Gordon (1988) is that a proportion of potential migrants, who are prepared to migrate, find employment in their current region and chooses to commute and therefore never become migrants. It could be argued that this is more likely to occur in larger labour market regions compared tp smaller ones. The higher propensity of people to stay in larger labour-market regions can be explained by the diversity of the labour market, which is especially important for dual-career households. It could also stem from other attractions such as the supply of education, healthcare and entertainment (WESTERLUND, 2001). Detang-Dessendre et al. (2002) found a similar tendency in France, where living in a rural or semi-rural area close to a larger city had an inhibiting effect on migration compared to living in more isolated localities, but this effect was only significant for young people as opposed to the middle-aged and elderly. Van Ham et al. (2001b) found a gendered commuting substitution effect whereby married men with children were more likely to substitute migration by commuting but that women in the same situation were less flexible in terms of both commuting and migration. However, unmarried women without children were found to be as flexible as men.

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In the literature, possible trade-offs between migration and commuting have often been discussed from a perspective of intraregional mobility (mainly urban) by which a person has

a choice, to either move or commute to a given job (EVERS and VAN DER VEEN, 1985; FRANSSON, 1991; VAN HAM and MULDER, 2005; VAN HAM et al., 2001b). This study, however, focuses instead on interregional migration when the migration-commuting choice is between accepting a job that requires migration or staying in one's present locality and tolerating a longer commute to another job. Choosing to live in a region with good access to labour market opportunities within commuting distance could be viewed as a strategic choice for establishing a better platform for a partner's employment and one's own future jobs (VAN HAM et al., 2001a).

In several Western countries, for instance Sweden and the Netherlands (VAN HAM and HOOIMEIJER, 2005), migration tolerance has decreased – at least for those who are in the labour force – and commuting tolerance has increased over the past decades. The observed increase in travel distance to work has been presented as a possible explanation for why interregional migration has declined (FRANSSON, 1991; KULLENBERG and PERSSON, 1997; SOU, 2007; WESTERLUND, 2001). According to such "substitution hypotheses", people today are more likely to choose extended commuting over other options, including interregional migration. The causal relationship between commuting and migration is, however, difficult to establish. Increased commuting is sometimes described as a result of improved transport systems (YAPA et al., 1971) and a more flexible labour market, reducing the cost of commuting in terms of time and money. Green (2004) exemplifies how employers and employees increasingly substitute intra-organisation relocation by short–term assignments and weekly commuting. Interregional migration would thereby become increasingly redundant as job search areas could be extended without having to relocate one's place of residence. The inverted argument would be that commuting is a result of restrictions in interregional migration; higher costs for migration make commuting a more attractive option. In the latter case, an increase in commuting is a result of people becoming more tied to a place by dual incomes or because they prefer to stay in a certain living environment for other reasons.

If the relative interregional immobility among families and people in the labour force were a result of substitution of interregional migration by daily mobility over longer distances, the difference in migration propensity in regions with ample job availability compared to more

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isolated ones would be larger in 2001 compared to 1970 and 1985. If, on the other hand, the inhibiting effect of living in a larger labour market were the same today as it was in 1970 and 1985, the result would suggest that people have become equally less migratory everywhere, regardless of job availability. In the first case, the conclusion would be that extended travel distance is one explanation for migration decline. In the latter case, the conclusion would be that longer travel distances are the result of migration reluctance.

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Trends in interregional migration and commuting

Interregional migration rates declined in Sweden during the period from the 1970's to the mid-1980's; thereafter, interregional migration increased again. The decrease from the high levels of migration in the 1960s and 1970s has been explained by Bengtsson and Johansson (1993) mainly as a result of restructuring and the expansion of the public sector. The increase in migration in recent decades is essentially an effect of increased migration propensity among young people outside the labour market, mainly students while families with children are becoming less migratory compared to thirty years ago (ISRAELSSON et al., 2003; JANS, 2005b; JOHANSSON et al., 2004; LUNDHOLM, 2007). There are several possible reasons for this increasing immobility among the gainfully employed; the organisation of the labour market with more short-term and insecure jobs could be one explanation, as could changing values and attitudes, which make more people unwilling to relocate. The development of an increasing share of two-income families is one important explanation for why people become more reluctant to migrate. Having a partner who works is known to reduce mobility and generate "tied stayers" among both women and men (BUCHEL and BATTU, 2003; GREEN et al., 1999; NIVALAINEN, 2005; SMITS, 1999). GREEN and CANNY (2003) finds that children's schooling is an important consideration for families when considering relocation. In Sweden, families including children who are in school (age 7-18) are found to be particularly reluctant to migration (FISCHER and MALMBERG, 2001).

Daily commuting has increased, in Sweden as well as in other European countries, in terms of both range and number. The average distance travelled to work in Sweden has increased by more than 50% during the past three decades; in 1970 the average commuting distance was estimated at 10 kilometres and in 2001 the corresponding distance was 15.6 km (SOU,

2003). It is important to keep in mind that the commuters behind this extension still constitute a minority, and the daily activity space of the majority of the population is unaffected by the extended commuting zones. Most people live close to their workplace; in Sweden in 2001, 50% of all men lived less than eight kilometres from work and 50% of women lived less than six kilometres from work. Only 5% of all women and 10% of all men travel further than 40 kilometres (SOU, 2003).

However, local labour markets are not equally accessible by all groups. Men and more qualified workers have access to larger labour markets than do women and less skilled workers (ÖSTH, 2007). This gender difference is explained by the unequal division of labour within the household, where women take on the most responsibility and therefore need to have shorter work trips in order to fulfil their obligations; for men, commuting is enabled by having a wife who facilitates daily life (HANSON and PRATT, 1991; JOHNSTON-ANUMONWO, 1992). The extended labour market for more skilled workers can be attributed to the segmented labour market where more skilled have more career opportunities and more to gain from commuting but also from specialisation that makes a large labour market more necessary for more skilled labour. Differences in commuting behaviour between skill-groups (and also other subgroups) are especially observable in more peripheral localities within the local labour markets. The reason for this is that as commuting becomes more costly, differences between groups become more evident (ÖSTH, 2007).

In Sweden and the other Nordic countries, large investments in infrastructure are being made to facilitate job commuting and politicians have expressed that expansions in work trips are a means to solve the problem of labour-market matching and trigger economic growth through better utilisation of skills and reduction of unemployment (NUTEK, 2000, 2001). Others question the blessings of longer work trips from different perspectives, for instance Boverket (2005) highlights the negative effects of long job trips in terms of environmental concerns, and in terms of social concerns from a child's perspective. Sandow and Westin (2007) conclude from their survey that a majority believes that the costs of daily commuting over distances that take more than 45 minutes of travel are too high and that this limits further expansion of commuting zones.

The trend of increased commuting can be interpreted as a result of people becoming increasingly reluctant to migrate, and therefore expanding their commuting tolerance length in order to be able to make a living while avoiding migration. Commuting is then regarded as a fair price for choosing residence in accordance with one's own preferences. This is only one of several hypotheses that could explain the development of extended commuting. Short-distance migration can also be an underlying cause of increases in commuting, as a settlement pattern characterized by suburbanisation has increased the distance between residence and work, and this pattern requires longer commuting (VERKADE and VERMEULEN, 2005). Another underlying circumstance is that ongoing improvements in transportation systems allow us to travel further in the same amount of time, which means that the commute can be longer without affecting the time consumed for travel (FRÄNDBERG et al., 2005) .

Data and method

The data used in this study consist of the entire working-age population of Sweden, those 18-65 years old during the years 1970, 1985 and 2001. Migrants are identified as people who migrated between parishes during the periods of 1969-1970, 1984-1985 and 2000-2001. None of the three time periods are extreme with regard to economic cycles. The deep recessions in the beginning of the 1970-ties and the early 1990-ties are avoided. A parish is an administrative unit; Sweden was divided into 3,170 parishes in 1970 and 2,223 in 2001. Migration distance is calculated as the distance between parish centroids, and interregional migrants are defined as persons migrating 150 kilometres or more.

In this study, the range of 150 kilometres as the definition of interregional migration was chosen for two reasons. First, as Zax (1994) points out, it is important to isolate interregional migration by which the migrant relocates both work and housing and thereby avoids including residential mobility, since the mechanisms behind these two phenomena are partially different. Second, the 150-kilometre range helps avoid gravitation effects; i.e., people living in areas close to urban areas are more likely to migrate compared to those living in more isolated places because of the pull effects of population concentrations. Or in other words, people are more likely to migrate when there is somewhere to migrate to, at a

close range, than if there is not. The existence of such an effect has been found by, for instance, Fotheringham et al (2004).[1]

In this study, job availability is defined as the size of the local labour market where the person resides during year one (1969, 1984, 2000), which is approximated by the size of the working-age population at a given Euclidian distance[2]. Two zones are studied: first, *the narrow labour market* surrounding each parish centroid with a radius of 30 kilometres. Within this distance, the daily activity space offers commuting possibilities that have an impact on daily life but still fall within boundaries that many people can accept (30-45 minutes' travel time)[3]. The outer realm of the labour market is 30-80 kilometres, *the extensive labour market* involving commuting costs that are unthinkable for some people but that many people find an acceptable commuting range. The labour markets are hence calculated as individual labour markets for each parish centroid. Job availability is thereby a feature of the locality where the individual resides. The actual individual access to the job availability of a locality might be restricted. We know that working trips are generally shorter for married women and less skilled workers; the control variables age, sex, civil status and education level are therefore included in the analysis.

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In-migration and out-migration are strongly correlated on the regional level; this means that regions with high levels of in-migration also have high levels of out-migration. Especially urban areas are very likely to have high levels of in-migration, but also high levels of out-migration, since a person who has recently migrated is known to be more prone to migrate again (FISCHER and MALMBERG, 2001; GORDON and MOLHO, 1995). The most mobile group of young, recent migrants are found in urban areas and there is therefore a positive correlation between migration propensity and population density. Another factor that contributes to high migration rates in densely populated areas is the concentration of rented housing in urban areas. People who are expecting to move again soon are more likely

[1] The results turned out to be robust at a closer range definition (80km) as well.

[2] The use of straight-line distance for delimiting labour markets rather than the functional local labour markets defined by Statistics Sweden is motivated by the fact that these regions are defined by average municipal commuting behaviour. Using these regions defined by observed commuting behaviour as explanatory variable could have an unpredictable effect on the interpretation of the results.

[3] Thirty kilometers might seem a short distance, but the actual distance on the ground is always longer since 30 kilometers (as well as 80 kilometers) refers to Euclidian distance.

to choose rental rather than owner-occupied housing; it is well established that people living in owner-occupied housing are less migratory (FISCHER and MALMBERG, 2001; HELDERMAN et al., 2006). By including recent migration in the analysis, the higher migration propensity in urban areas due to this selection effect is somewhat controlled for. People who were not living in their present municipality four years earlier are defined as recent migrants.

Migration propensity is tested in a logistic regression model in which the effects of size of the labour market zones are included as independent variables. The model also includes the individual variables age, sex, civil status, children (<age 18) living in the household, education level and recent migration. These are individual characteristics during year two[4] (after migration, if any - 1970, 1985, 2001).

Results

Figure 1 is a description of interregional migration rates for the years included in this study. The total migration frequency for long-distance migration (>150 kilometres) was lower in 1985 compared to 1970 and 2001. The rise in migration rates from the low levels of the mid-1980's to 2001 is explained mainly by high migration rates among young people (mainly students) (ISRAELSSON et al., 2003; LUNDHOLM, 2007; SOU, 2007). The migration rate among adults living with children under age 18 in the household was much lower in 1985 compared to 1970, and there had been no increase in the migration rate within this group in 2001.

Figure 1 Interregional migration frequency (>150 kilometres, age 18-65)

In order to compare migration propensity between individuals living in regions with access to high job availability and those living in regions with lower job availability, and to investigate differences in this effect over time, the propensity for interregional migration in 1970, 1985 and 2001 was tested in separate logistic regressions[5]. Independent variables were

[4] Ideally, pre-move characteristics would have been more relevant, but that was not available in this dataset.

[5] Differences between the three years were also tested in the same model as interaction variables; thus the remarks on the differences between years in the text have statistical support. The tables presented were chosen because they were more readable.

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age, sex, civil status, having children, education level, recent migration and size of labour market. Results from the analysis are presented in Table 1.

Results from the controlling variables were expected. Migration propensity decreases with age; this is more evident in 2001 compared to 1970 and 1985. Being married and having children reduces the propensity to migrate, while higher education increases the likelihood of being a migrant. The positive effect on migration by higher education has decreased since 1970, which could be attributed to a larger proportion of the population being included in this category and a large proportion of the addition to this group being employees in the public sector, with a dispersed localisation pattern (for further discussion on the development of migration propensity during the period 1970-2000 for different groups, see Jans (2005a) and Lundholm (2007). As expected, recent migration had a strong positive effect on migration propensity.

As expected, migration (>150km) was less likely among those living in parishes situated situated in labour market areas with higher job availability, compared to residents in more areas of less job avaliability. A large labour market provides alternatives to migration, as the prospect of finding a suitable job without having to migrate is better. The sizes of both the narrow and the extensive labour markets contributed to reducing migration propensity.

Table 1 Logistic regression estimates of odds of being interregional migrant (1= migrant>150km) (N=population in working ages 18-64)

The analysis is based on the hypothesis that access to commuting opportunities has become more important for migration behaviour as a result of the extension of commuting zones. If so, the substitution effect would manifest itself in an increase in the reducing effect over time on migration propensity caused by living in a large labour-market region. Further, the effect of job availability in the extensive commuting zone would be expected to have a stronger impact on migration propensity in 2001 compared to 1970 and 1985. However, the empirical findings do not support these hypotheses. The results from regression analysis show that the inhibiting effect of residing in a large labour market is the same for all three years. The significant difference found between the three years was that the inhibiting effect

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of job availability, estimated by the size of the narrow labour market, was somewhat weaker in 1986 than in 1970, which means that those who lived in the densest areas locally were more prone to migrate in 1986 than in 1970, which could be an effect of a counter-urbanisation trend at that time. However, in general, job availability in both a narrow and extensive labour market had a similar inhibiting effect on migration during the years 1970, 1985 and 2001.

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Migration propensity among parents compared to others was significantly lower in 2001 compared to both 1985 and 1970, suggesting that migration tolerance for this group is lower today than before. An important explanation could be the increase in dual-income households. This makes this group especially interesting in testing the commuting substitution hypothesis, since it is reasonable to assume that as families have become more tied to their region and reluctant to migrate, they are more prone to accept longer commuting as a substitute, if they have access to ample job availability.

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Data in this study are individual and contain information on civil status and children in the household for individuals, but unfortunately there are no data on, for instance, partner's employment or education level; therefore, dual-income families cannot be studied explicitly. Despite this, an attempt was made to study families in comparison with other groups; for this purpose, individuals with children are analysed separately as a proxy for family migration. By introducing interaction variables for family, a model tested whether the effect on labour-market size differs between individuals with children and individuals who do not live with children. The results from this analysis are found in Table 2.

Table 2: Logistic regression estimates of odds of being interregional migrant (1= migrant>150km) including interaction variables for having children (N=population in working ages 18-64)

The inhibiting effect on migration of living in a region with ample job availability in the extensive labour market (30-80 kilometres) was stronger for persons with children compared to others in 2001. This was not the case in 1985, when families did not significantly differ from others, and in 1970 when the migration propensity was somewhat higher for families in

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regions with ample job availability than for others. This result give some support for the presence of a substitution effect between commuting and long-distance migration for this subgroup, since families appeared to be less prone than others to choose interregional migration if the commuting opportunities were good in 2001, as opposed to 1985 or in 1970 when there was no such effect.

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The effect on migration propensity of living in a large, narrow labour market was more positive for families with children compared to others during all three years, and the effect was stronger in 2001 than in 1970 and 1985. This result is difficult to interpret, but could be explained by the preference among families to leave the most densely populated areas (facilitated by improved commuting options), or as a result of this group being pushed out because of the housing market. The definition of interregional migration as migration exceeding 150 kilometres should exclude suburbanisation, but there might be a spill over effect of families who leave the urban areas for more remote destinations.

In summary, this study confirms the results from prior studies that people are less likely to migrate in larger labour-market regions. Living in a large, diversified labour market allows people to stay rather than migrate to another region. The analysis of this effect of labour-market size on migration propensity over time produced some mixed results. In general, the impact of commuting opportunities on interregional migration rates is not higher in 2001 than it was in 1970 or 1985. There are no evidence that the trend of extended commuting have affected the rate of interregional migration in general. On the other hand, when looking at the subgroup, persons in households including children, the impact of living in a region with favourable commuting opportunities seems to have a more inhibiting effect on families compared to others in 2001, which is different from 1970 and 1985. But the casual relations here should be interpreted with caution, not least since the process of extended commuting seems to be a more general phenomenon.

Discussion

A person who lives in a location with ample job availability has better prospects of choosing to stay rather than migrate; thus job availability is one factor that could explain non-migration. Migration does not become as compulsory when one has access to many potential

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jobs, and a diversity of jobs, within commuting distance. The result of this study suggests that there could be a substitution effect between interregional migration and commuting, since those who live in localities with poor job availability are more inclined to migrate. This relation is stable over time and therefore no support is found for the notion that the trend of extended commuting is suggesting that access to commuting opportunities has become more important for interregional migration over time.

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Has increased job commuting replaced interregional migration or is the relationship the opposite – has decreased interregional migration forced the process of extended job commuting? The results of this study suggest that the latter is the case. Extended commuting has a more important role in facilitating labour-market matching today than before as people become more reluctant to migrate inter-regionally, but this growing reluctance seems to be distributed equally across labour markets regardless of size. Although access to commuting opportunities does have an effect on migration behaviour, this relation has not changed over time. Increased commuting can facilitate job matching and reduce the risk of over-qualification at a regional level, but this study indicates that increased commuting has not reduced interregional migration.

An possible explanation why the influence of commuting opportunities on migration behaviour has not increased, despite the reported extended commuting, could be that the statistical evidence of extended commuting is misleading and a result of misinterpretation of the statistics rather than an actual development (AMCOFF, 2007).

It is reasonable to assume that the causal relationship between increased commuting and the decrease in migration is not direct but rather indirect, via processes of ongoing changes in the labour market and household structures. Increased migration to commuting substitution might not be a general trend, but rather a tendency among increasingly less migratory groups, such as families. There are results in this study that confirm that there is a difference between families and others in this respect, but more research is needed in order to determine the extent of the differences between subgroups.

Further research could contribute to the understanding of the interrelation and dynamics of the processes of migration and commuting. Such research needs to take into account migration and commuting simultaneously, with empirical data on both actual migration and actual commuting. The measure of job availability could also be developed in a more sophisticated way, for instance by using number of jobs or job vacancies as quantification and/or putting more weight to closer jobs compared to more distant (calculating a commuting potential). More research could also further investigate the migration and commuting decisions of dual-career households and families with children, since this is a group that has been empirically proven to have become less migratory and theoretically could be a group that is increasingly compelled to use commuting as a means to solve labour-market matching. Another interesting issue is how overqualification is related to (lack of) migration and commuting opportunities.

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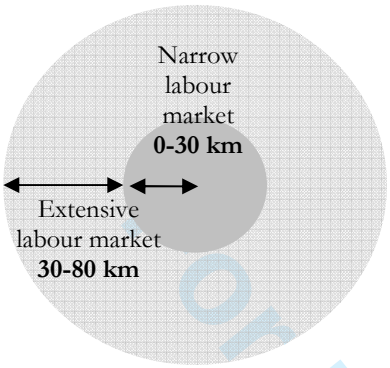

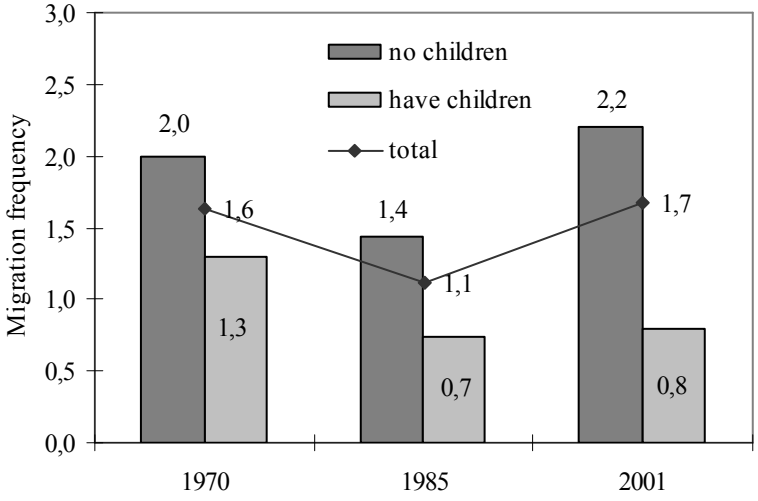

Table 1 Logistic regression estimates of odds of being interregional migrant (1= migrant>150km) (N=population in working ages 18-64)

	B (S.E)		
	1970	1985	2001
Woman	-0.006 0.008)	0.144*** (0.009)	0.121*** (0.007)
Man (ref)			
Age 18-20	-0.162*** (0.015)	-0.172*** (0.018)	0112*** (0.013)
Age 21-24	0.188*** (0.011)	0.260*** (0.014)	0.431*** (0.010)
Age 25-30 (ref)			
Age 30-34	-0.313*** (0.013)	-0.371*** (0.016)	-0.484*** (0.012)
Age 35-44	-0.775*** (0.013)	-0.715*** (0.015)	-0.925*** (0.013)
Age 45-54	-1.355*** (0.016)	-1.311*** (0.021)	-1.640*** (0.016)
Age 55-65	-1.897*** (0.026)	-1.674*** (0.023)	-1.935*** (0.018)
Married	-0.108*** (0.011)	-0.207*** (0.013)	-0.242*** (0.011)
Not married (ref)			
Children	-0.305*** (0.011)	-0.517*** (0.013)	-0.775*** (0.011)
No children (ref)			
High education	1.089*** (0.010)	0.893*** (0.010)	0.640*** (0.008)
Low education (ref)			
Recent migration	1.018*** (0.008)	1.226*** (0.010)	0.891*** (0.007)
Same municipality 4 years prior (ref)			
LM size 0-30 km (cont)	-0.130*** (0.003)	-0.107*** (0.004)	-0.112*** (0.003)
LM size 30-80 km (cont)	-0.275*** (0.004)	-0.271*** (0.005)	-0.271*** (0.004)
Constant	0.947*** (0.044)	0.259*** (0.051)	0.899*** (0.036)
N	4200830	4585523	5300630
Model chi-square	74618	61162	127901
-2 Log likelihood	650018	490127	774427
Nagelkerke R square	0.111	0.117	0.152

*** = p<0.001, **= p<0.01, *=p<0.05, Standard errors in parentheses

Table 1: Logistic regression estimates of odds of being interregional migrant (1= migrant>150km) including interaction variables for having children (N=population in working ages 18-64)

	1970	1985	2001
Woman	-0.003 (0.008)	0.147*** (0.009)	0.124*** (0.007)
Man (ref)			
Age 18-20	-0.166*** (0.015)	-0.190*** (0.018)	0.090*** (0.013)
Age 21-24	0.187*** (0.011)	0. 253*** (0.014)	0.422*** (0.010)
Age 25-30 (ref)			
Age 30-34	-0.314*** (0.013)	-0.373*** (0.016)	-0.489*** (0.012)
Age 35-44	-0.772*** (0.013)	-0.721*** (0.015)	-0.933*** (0.013)
Age 45-54	-1.352*** (0.016)	-1.319*** (0.021)	-1.650*** (0.016)
Age 55-65	-1.896*** (0.026)	-1.685*** (0.023)	-1.950*** (0.018)
Married	-0.103*** (0.011)	-0.212*** (0.013)	-0.256*** (0.011)
Not married (ref)			
Children	-1.232*** (0.089)	-2.057*** (0.109)	-2.373*** (0.098)
No children (ref)			
High education	1.088*** (0.010)	0.890*** (0.010)	0.640*** (0.008)
Low education (ref)			
Recent migration	1.020*** (0.008)	1.233*** (0.010)	0.894*** (0.007)
Same municipality 4 years prior (ref)			
LM size 0-30 km	-0.148*** (0.004)	-0.147*** (0.004)	-0.147*** (0.003)
LM size 30-80 km	-0.289*** (0.006)	-0.272*** (0.006)	-0.259*** (0.004)
LM size 0-30 km * children	0.048*** (0.006)	0.137*** (0.008)	0.222*** (0.008)
LM size 30-80 km*children	0.032*** (0.009)	0.001 (0.011)	-0.078*** (0.010)
constant	1.321*** (0.056)	0.733 (0.059)	1.122*** (0.039)
N (included in analysis)	4200830	4585523	5396824
Model chi-square	74781	61620	128891
-2 Log likelihood	649856	489670	773438
Nagelkerke R square	0.111	0.118	0.153

** = p<0.001, **= p<0.01, *=p<0.05, Standard errors in parentheses